

CLAIMS

1. Method for forming a separator plate for a fuel cell, which separator plate has a number of projecting sections, characterized in that the projecting sections in the separator plate are formed by a metal plate being pressed onto a die having a number of recessed sections with the aid of a pressurized fluid or by the die being pressed onto the metal plate supported by pressurized fluid, the recessed sections in the die corresponding to the projecting sections which are to be formed in the metal plate, in order to obtain the separator plate having the projecting sections.
2. Method according to Claim 1, in which the pressure of the fluid is selected to be sufficiently high for the metal plate to be pressed onto the die over its entire surface.
3. Method according to Claim 1 or 2, in which a calibration pressure is selected for the pressure of the fluid.
4. Method according to one of the preceding claims, in which the pressure of the fluid is selected to be between 250 and 6000 bar (25 and 600 MPa), preferably between 500 and 1000 bar (50 and 100 MPa) or between 1000 and 6000 bar (100 and 600 MPa), more preferably between 1500 and 6000 bar (150 and 600 MPa), and even more preferably between 2000 and 6000 bar (200 and 600 MPa).
5. Method according to one of Claims 1 – 4, in which the metal plate is first placed against the die, and the metal plate is then pressed onto the die by the pressurized fluid.
6. Method according to one of Claims 1 – 4, in which the metal plate is first placed under a preliminary pressure by the fluid, and then the die is pressed onto the metal plate and the fluid is pressurized.
7. Method according to one of the preceding claims, in which a membrane is placed between the metal plate and the fluid, preferably a membrane provided with a coating in order to simultaneously coat the metal plate.

8. Method according to one of the preceding claims, in which a plate made from a readily deformable metal is selected as metal plate, such as low-carbon steel, ultralow-carbon steel, aluminium, stainless steel or titanium.
- 5 9. Method according to Claim 8, in which the metal has a deformability corresponding to a uniform elongation at break of at least 20%.
- 10 10. Method according to one of Claims 1 – 9, in which the plate is at room temperature during the pressing operation.
- 11 11. Method according to one of Claims 1 – 9, in which the plate is at elevated temperature during the pressing operation, for example 500 – 1000°C for carbon steel, 100 – 550° for aluminium and 600 – 1300°C for stainless steel.
- 15 12. Method according to one of the preceding claims, in which the thickness of the metal plate prior to the deformation is selected to be between 0.05 and 0.40 mm, preferably between 0.05 and 0.20 mm.
- 20 13. Method according to one of the preceding claims, in which at the same time as the projecting sections are being pressed into the metal plate, the metal plate is cut into a desired shape and size.
- 25 14. Separator plate having a number of projecting sections, produced using the method of one of the preceding claims, characterized in that the separator plate is formed from a readily deformable metal plate, such as a plate made from low-carbon-steel, ultralow-carbon steel, aluminium, stainless steel or titanium.
- 30 15. Separator plate according to Claim 14, in which the metal has a deformability corresponding to a uniform elongation at break of at least 20%.
- 35 16. Separator plate according to Claim 14 or 15, in which the thickness of the separator plate is between 0.05 and 0.40 mm, preferably between 0.05 and 0.20 mm, at the undeformed sections of the plate.
17. Separator plate according to one of Claims 14 – 16, in which the rounding radius of the transitions in the plate is at least equal to the thickness of the undeformed sections of the plate.

18. Separator plate according to one of Claims 14 – 17, in which the projecting sections have a repeating pattern with a pitch w and a depth d , where $0.03 < d/w < 1.2$, preferably $0.1 < d/w < 0.5$, more preferably $0.2 < d/w < 0.5$ if the plate is deformed at room temperature, and where $0.03 < d/w < 2.4$, preferably $0.2 < d/w < 1.0$ and more preferably $0.4 < d/w < 1.0$ if the plate is deformed at high temperature.
19. Separator plate having a number of projecting sections, in which the projecting sections are surrounded by a substantially planar section of the separator plate, the projecting sections having a substantially repeating pattern with a pitch w and a depth d , where $0.25 < d/w < 2.4$.
20. Separator plate according to Claim 19, in which the thickness of the separator plate is between 0.05 and 0.40 mm, preferably between 0.05 and 0.20 mm, at the undeformed sections of the plate.